1980s, the Commission had repeatedly expressed concern that tariffing under section 203 of the Communications Act suppressed price initiatives of any one of the carriers. The reasons were straightforward: the tariff required that terms and conditions of a carrier's service offerings be published before they were to go into effect; and the carrier could not deviate from tariffed prices when they were in effect. In 1983 when the Commission embarked on its "forbearance" policy,[166] it explained that it sought to eliminate all tariff filings by MCI and Sprint[167] because that would provide "an excellent mechanism for inducing competitive pricing."[168] The Commission found that "traditional tariff regulation of nondominant carriers is at odds with the purposes of the [Communications] Act because it inhibits price competition, service innovation, and the ability of firms to respond quickly to market trends."[169] Indeed, the Commission later concluded that the tariff process encouraged nondominant carriers to follow AT&T's lead in setting their rates.[170] The Department of Justice expressed a similar concern in 1990 that the tariffing process promoted tacit collusion among AT&T, MCI, and Sprint.[171]

Permissive detariffing would have made it possible for MCI and Sprint to offer their services with price discounts that

166. Policies and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorizations, Fourth Report and Order, 95 F.C.C.2d 554 (1983) [hereinafter *Fourth Report and Order*].

167. Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorizations, Further Notice of Proposed Rulemaking, CC Dkt. No. 79-252, 84 F.C.C.2d 445, 478–79 ¶ 87 (1981).

168. *Id.* at 454 ¶ 26.

169. Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorizations, Second Report and Order, CC Dkt. No. 79-252, 91 F.C.C.2d 59, 65 ¶ 12 (1982).

170. By late 1993, in its attempt to reestablish detariffing after remand from D.C. Circuit, the Commission repeated its warning, but with a distinct variation in wording: "traditional tariff regulation of nondominant carriers . . . is *actually counterproductive* since it can inhibit price competition, service innovation, entry into the market, and the ability of carriers to respond quickly to market trends." *Tariff Filing Requirements for Nondominant Carriers*, 8 F.C.C. Rcd. at 6752 ¶ 2 (emphasis added).

171. Reply Comments of the U.S. Department of Justice, CC Dkt. No. 90-132, at 41, 44–46 (filed Sept. 28, 1990).

challenged AT&T's prices. But those two other carriers declined permissiveness and instead continued to offer their services only under tariff. MCI's challenge to the Commission's prohibition is particularly telling in that context; in a competitive market, one would think that MCI would seek to be relieved of the burden of filing tariffs.[172] That the industry was engaged in "umbrella pricing," as described by the Commission itself, was evident:

> [O]ne firm behaves as a price-searcher and the others as price-takers. The price-searcher finds a price he likes; the others take that price as a given in deciding how much to supply, expanding their supply the higher the given price. The price-searcher takes these supply decisions into account (*i.e.*, he anticipates the reactions of the fringe to the price he chooses) in deciding what price he likes. He, of course, prefers a high price, but the higher the price, the less he sells as consumers substitute other goods and the competing products of fringe suppliers. So he must balance the gains and losses of a higher price in deciding what price maximizes his profit.[173]

The carriers' tariff submission practices themselves contributed further to cooperative pricing patterns. After 1990, AT&T submitted tariffs once or twice per year on repeated dates, to be followed by quite similar submissions from MCI and Sprint. For example, AT&T submitted its standard tariff for Message Toll Service with an index price of 23.3 cents per minute at the end of 1990 for customers making calls to points from 400 to 2,000 miles distant, during the daytime working week (those specifications for "representative" subscriber usage are described, as are the tariffs, in chapter 6). MCI submitted its revised tariff with an index priced at 22.2 cents and Sprint submitted at 22.4 cents per minute for the

172. MCI *v.* FCC, 765 F.2d 1186 (D.C. Cir. 1985).

173. FCC, WHAT MAKES THE DOMINANT FIRM DOMINANT? 3–4 (OPP Working Paper No. 25) (Apr. 1989).

same representative service package. Between 1991 and 1993, AT&T in each new tariff initiated a change in that index price that was followed by MCI and Sprint with changes that became more and more similar. By December 1993, AT&T was charging 23.5 cents, MCI was charging 23.4 cents, and Sprint was charging 23.5 cents per minute for that service. The narrowing of the difference between AT&T's prices and those of the other two large carriers further indicated how price caps in those markets actually have worked. In mid-1984 AT&T's prices were 10 to 20 percent higher than its competitors'. By 1987, the gap was only about 5 percent, and the gap had shrunk to close to zero for MTS standard services by the end of 1995 (as shown in chapter 6).

That sequence of submissions with price convergence was not just in tariffs for basket one services. It was present in outbound WATS and after 1991 in Inbound WATS as well. Remarkably, even in virtual network services, for which subscriber self-provision of service provided a significant competitive alternative, AT&T submitted tariffs that generated price changes from 1990 to 1993 that MCI followed with its own changes only different by 0.6 to 0.8 cents per minute.

Delays and Other Nonsense

The tariffing process provided competitors with the mechanism for imposing delays and litigation costs on a carrier making a deviant submission. The carriers have employed a procedure by which to file an objection to another's tariff to ensure that another carrier did not move out from under the pricing umbrella. In 1987 AT&T filed a Tariff 12, a one-customer contract, showing a single set of prices for services integrated into a private network designed for General Electric Telecommunications Network (GETN).[174] MCI and Sprint objected on grounds that AT&T had offered an index price for that bundle of services less than the sum of the prices to customers buying parts of the bundle so that it was discriminatory. Their concern, however, was more likely that AT&T was pricing service

174. AT&T Request for Waiver of Rules Regarding Proposed Custom Designed Integrated Service, 2 F.C.C. Rcd. 3915 (1987)

to GETN at a low level.[175] AT&T revised the tariff by taking out the express reference to GETN[176] and making the offering available to "similarly situated" customers.[177] MCI challenged the Commission's ruling approving that tariff, and the D.C. Circuit Court remanded the proceeding to the Commission,[178] which again approved the tariff, ruling that the offering was not *per se* discriminatory.[179]

AT&T's Tariff 15, designed to allow AT&T to tailor services further to large customers able to self supply at least parts of the network, faced the same objections from other carriers.[180] Sprint complained that AT&T was "effectively underpricing" Sprint's comparable services.[181] MCI objected that the offering

175. AT&T Response to Tariff F.C.C. No. 12, 4 F.C.C. Rcd. 5430, 5431 ¶ 10 (1988); MCI Petition to Reject at 10–11, AT&T Communications, Revisions to Tariff F.C.C. No. 12, Transmittal No. 1592 (FCC May 19, 1989) (complaining that AT&T's offerings propose significant price reductions); Sprint Petition to Reject or Alternatively Suspend and Investigate at 16–17, AT&T Communications, Revisions to Tariff F.C.C. No. 12, Transmittal No. 1592 (FCC May 19, 1989) (complaining that under the offerings AT&T's expenses have been reduced without justification).

176. AT&T Communications Tariff F.C.C. Nos 10 and 12, 2 F.C.C. Rcd. 5493, 5493 n.6. (1983).

177. AT&T, Revisions to Tariff FCC No. 12, 4 F.C.C. Rcd. 4932, 4938 ¶ 60, *recon. denied*, 4 F.C.C. Rcd. 7928 (1989), *rev'd and remanded*, MCI *v.* FCC, 917 F.2d 30, 37 (D.C. Cir. 1990); AT&T Communications, Revisions to Tariff F.C.C. No. 12, 4 F.C.C. Rcd. 5430 ¶ 2.

178. MCI *v.* FCC, 917 F.2d at 30.

179. AT&T Communications, Revisions to Tariff F.C.C. No. 12, 6 F.C.C. Rcd. 7039, 7055 ¶ 87 (1991).

180. AT&T Communications, Tariff F.C.C. No. 15, Competitive Pricing Plans—Holiday Rate Plan, 4 F.C.C. Rcd. 7933 (1989), *recon. denied,* 5 F.C.C. Rcd. 1821 (1990); *see also* AT&T Communications, Revisions to Tariff F.C.C. No. 15, Competitive Pricing Plan No. 17, 6 F.C.C. Rcd. 5353 (1991); AT&T Communications, Revisions to Tariff F.C.C. No. 15, Competitive Pricing Plan 5—La Quinta Motor Inns, Inc., 5 F.C.C. Rcd. 4581, 4582 ¶¶ 7–10 (1990); AT&T Communications, Tariff F.C.C. No. 15, Competitive Pricing Plan No. 2—Resort Condominiums Int'l, 6 F.C.C. Rcd. 5648, 5649-50 ¶¶ 9–11 (1991), *remanded,* AT&T v. FCC, No. 91-1504 (D.C. Cir. Jan. 21, 1992); AT&T Communications, Tariff F.C.C. No. 15, Competitive Pricing Plan No. 2—Resort Condominiums Int'l, 7 F.C.C. Rcd. 3036 (1992).

181. AT&T Communications, Revisions to Tariff F.C.C. No. 15, Competitive Pricing Plan No. 17, 6 F.C.C. Rcd. 5353 ¶ 8 (1991), Opposition of Sprint, AT&T Communications, Tariff F.C.C. No. 15, No. 90-327 (FCC Nov. 21, 1991).

threatens "an effectively competitive interexchange market."[182] The Commission found the tariff not unlawful but suspended it following an order from the D.C. Circuit.[183] Similarly, responses to AT&T's Tariff 16 for large volume services to be provided to the Defense Department faced an MCI challenge[184] in which it complained that "AT&T is shielding rates that are unreasonably discriminatory" and that Tariff 16 constituted "predatory pricing."[185] Martin Marietta and MCI complained that AT&T's proposal to provide Federal Telecommunications Service 2000 offered an illegal rebate[186] and that AT&T was pricing below costs.[187]

The procedures of the Commission related to price setting were complemented by other, less notorious case practices. Over the period 1987-1994, AT&T made transmittals to revise tariffs that changed service offerings to large users. These had the potential of destabilizing tariffs across carriers and in all the major transmittals the response of MCI, Sprint or both was to object to them. In transmittals 434 and 435 (1986), AT&T proposed to revise its

182. MCI Opposition to Direct Case at 1, AT&T Communications, Tariff F.C.C. No. 15, No. 90-27 (FCC Nov. 21, 1991).

183. AT&T Communications, Tariff F.C.C. No. 15, 7 F.C.C. Rcd. 818, 819 ¶ 8 (1992).

184. AT&T Communications, Tariff F.C.C. No. 16, 4 F.C.C. Rcd. 2231 (1989); *see also* AT&T Communications, Revisions to Tariff F.C.C. No. 16, 5 F.C.C. Rcd. 468 (1990).

185. 4 F.C.C. Rcd. at 2231 ¶ 4; *see also* 5 F.C.C. Rcd. at 468 ¶ 3–4; MCI Telecommunications Corp., Comments in Opposition at 2, AT&T Application for "Special Permission" No. 511 to Waive Requirement That Proposed AT&T Tariff F.C.C. No. 16 Federal Telecommunications Service 2000 (FTS 2000) Rates be Published (FCC Feb. 10, 1989); WilTel, Petition to Reject or Suspend and Investigate at 3, AT&T Communications Tariff F.C.C. No. 16, Transmittal No. 1555 (FCC Apr. 14, 1989).

186. AT&T Communications, Revisions to Tariff F.C.C. No. 16, 4 F.C.C. Rcd. 5043, 5044 n.4 (1989). *See* Petition of Martin Marietta to Reject or Suspend, AT&T Communications, Tariff No. 16, at 18 n.26, Transmittal No. 1555 (FCC Apr. 14, 1989).

187. "AT&T's FTS 2000 rates are not compensatory, the carrier's other rate payers will be unreasonably burdened, and competition was unfairly restrained." Petition to Reject of Martin Marietta Corp. at 12, AT&T Communications, Tariff F.C.C. No. 16 FTS 2000, Transmittal No. 1555 (FCC Apr. 14, 1989). Marietta Corp. added, "[U]nder any reasonable standard, AT&T intends to provide FTS 2000 services at a loss." *Id.* at 2.

tariffs 2, 9, and 10 to allow customers to access its class four switch at discount rates; MCI and Sprint in response took the position that doing so gave it an unfair competitive advantage in its WATS offerings. In Transmittals 1063 and 1064 (1987), to reduce tariff rates on both MTS and WATS, Sprint stated that the reductions were merely to shift cost recovery from more to less competitive service categories. In special rate offerings for services to hotel chains (the "Hospitality Network Services"), respondents called for "competitive necessity" tests (FCC Transmittal 1386 (1988)). Further tests were to determine whether proposed prices were unduly discriminatory (*cf.* FCC Transmittal 1445 (1988)), based on flawed projections (*cf.* FCC Transmittal 1552 (1988)) and targeted to favor specific customers (*cf.* FCC Transmittal 2032 (1989)).

Over the eight years, AT&T filed 36 major transmittals for revised service offerings that elicited such responses from the other major carriers. The Commission held hearings, and in most cases rejected the responses of the other carriers objecting to the offering. In a number of specific cases, involving the allegation that AT&T was bundling services to offer with its 800 services for which it had a dominant position, the Federal Communications Commission rejected or required revisions in the submittal (*cf.* FCC Transmittals 3525 and 3571 ((1992)). The general thrust of the results of these practices was that AT&T, by delay or rejection, was required to hold to its main tariffs, for any variations on well established services, until the other large carriers could bring similar services in line.

Those cases added up. In 1989 the Commission's Office of Plans and Policy found that its regulatory apparatus provided carriers with a forum for "self-serving attempts to sustain an outmoded regime of regulation that supplies protection from competition."[188] Alfred Sikes, then the Commission chairman, complained that tariff procedures "limit the ability of a major competitor—AT&T—to compete. Current procedures afford many ways to energize the regulatory process to block price reductions potentially offered by AT&T. Most importantly, that holds prices

188. FCC, WHAT MAKES THE DOMINANT FIRM DOMINANT? 11–12 (OPP Working Paper No. 25) (Apr. 1989).

artificially higher, and reduces customer choice."[189] "It is a reasonable supposition," Alfred Kahn concluded, "that the apparent failure of competition itself to produce substantial price reductions in long-distance telephony has been attributable in important measure to continued regulatory handicapping of AT&T and sheltering of its competitors."[190]

Then how do these procedures involving caps and tariffs fit together to affect competition? In theory, price caps as imposed on an existing three-firm market would prevent monopoly price levels from being set collectively and would provide incentives to operate efficiently.[191] That is the theory but in fact there are three major aspects of regulation to the contrary. (1) Caps on access charges make all carriers' costs the same. In markets with three carriers providing homogenous services under conditions of uniform operating costs, the incentive for each is to have price ceilings become cemented in place from below. It is in the collective interest of those carriers and the regulator that ceilings also become floors. (2) This is especially the case on new service offerings where regulatory constraints in the tariff submission process prevent the largest firm from growing relative to the rest of the market. (3) Each carrier's filing of tariffs stabilizes inter-carrier informational exchange across long-distance markets. The Commission, by certifying price floors and ceilings at levels for any one carrier that are preemptively reviewed by all carriers, generates not a price umbrella but a shared price level for all carriers.

Tracing Regulation's Role in Price Level Changes Since Divestiture

Indices of average prices for long-distance services have decreased

189. Hearing Before the House Subcomm. on Telecommunications and Finance, Comm. on Energy and Commerce, 102nd Cong., 1st Sess. (June 19, 1991) (statement of Alfred C. Sikes, FCC Chairman), 1991 F.C.C. LEXIS 4212.

190. Alfred Kahn, The Necessary Conditions of Effective Competition for Local Transport at 12, Comment of Bell Atlantic, Expanded Interconnection with Local Telephone Company Facilities, No. 91-141 (FCC Aug. 6, 1991).

191. WILLIAM J. BAUMOL & J. GREGORY SIDAK, TOWARD COMPETITION IN LOCAL TELEPHONY 51 (AEI Press & MIT Press 1994).

50 percent since divestiture. This decline is often cited as proof that regulation by divesting AT&T of its operating companies and by fostering entry has caused competitive pricing to break out in these markets.[192] But industry analysts, even including the Commission, have linked the decline in price levels to reductions in access charges.[193] Moreover, long-distance carriers did not pass along all such reductions in lower prices, as they would have if there were competitive pricing.

Changes in access charges have followed Commission mandates. Since divestiture, the Commission partly replaced access charges by flat-rate line charges like the subscriber line charge. As a result, the access charges paid by AT&T and the other carriers were mandated to decrease.[194] Access charges indeed fell as a percentage of local carrier revenues. In 1984 the long-distance carriers paid out 24 percent of revenues to local exchange carriers in access charges (see table 1-1). The same was true in 1987.[195] But by 1991, long-distance companies paid only about 22 percent of their revenues to local exchange companies.[196] The explanation is that they did not pass on all of the access cost reductions to consumers.

Alternative analyses agree with this judgment. A 1992 study found that between 1984 and 1992, access charges fell by $10.13 billion, but only $8.22 billion of which was passed on in rate reductions.[197] That study concluded that "reductions in carrier

192. Hearing Before the House Subcomm. on Telecommunications & Finance, Comm. on Energy and Commerce, 102nd Cong., 1st Sess. (May 10, 1995) (Statement of Robert E. Allen, Chairman and Chief Executive Officer of AT&T Corp.)

193. In the AT&T Price Cap Order, the FCC observed, "The single force most responsible for driving down long-distance rates over the last several years has been the reduction of access charges." *Rates for Dominant Carriers*, *supra* note 127, at 3054 ¶ 365.

194. *Id.* at 3132–33 ¶¶ 532–39.

195. AT&T Communications, CC Dkt. No. 87-611, Direct Case of AT&T, Attachment 3 (filed January 28, 1988). Approximately 84.6 percent of AT&T's total nonaccess costs were interstate costs. Attachment 3, *Rates for Dominant Carriers*, *supra* note 127, at 2961 ¶ 168.

196. GEODESIC NETWORK II, *supra* note 3, at 3.22–3.23; but *see* table 1-1.

197. WILLIAM TAYLOR, NATIONAL ECONOMIC RESEARCH ASSOCIATES, EFFECTS (continued...)

access charges more than accounted for reductions in AT&T's toll prices."[198] In Alfred Kahn's words, "[the mandated access charge reductions] produced enormous net economic benefits, but it was they, and not competition itself, that caused prices to decline and demand to grow more rapidly than it would otherwise have done."[199] The study also found that between 1972 and 1984, inflation-adjusted interstate toll rates, net of changes in access charges, fell by 6.2 percent per year, twice as fast than in the seven years after divestiture.

The Commission assumed that it would prevent AT&T from withholding cost savings via the price cap adjustments mechanism. Under price cap regulation, access charge reductions are treated as exogenous events. Lower access charges would automatically reduce AT&T's price cap, forcing the firm to reduce prices. But the price cap is not reduced by AT&T's cost savings when they exceed that associated with the productivity adjustment factor, or when the service is in a basket without caps. Also prices are not reduced by the regulatory process when AT&T substitutes competitive access service providers for local carrier access services. Such alternatives provided a growing segment of local access service, as their route miles increased from 133 in 1987 to 2,071 in 1991, and fiber miles from 7,770 to 105,148 over the same period.[200]

The final reason why regulated rate reductions did not achieve the pass-through of cost reductions is that the Commission refused to recognize that its policies did not achieve that result. In assessing compliance with the price cap process in 1995, the Commission found that the regulated local carriers' interstate access charges were $1.5 billion lower than at the time price caps were instituted.[201] In 1995 the Commission rejected the argument that

197. (...continued)
OF COMPETITIVE ENTRY IN THE U.S. INTERSTATE TOLL MARKETS: AN UPDATE 1 (May 28, 1992).

198. *Id.*

199. Kahn, *supra* note 195, at 12.

200. J. Kraushaar, Industry Analysis Division, Common Carrier Bureau, FCC, Fiber Deployment Update, 1991 (March 1992); J. Gross, Donaldson Lufkin & Jenrette, Report No. 1226863, Local Telephone Competition, May 18, 1992.

201. Notice, 9 F.C.C. Rcd. at 1691 ¶ 25.

interexchange carriers had not passed on those savings to consumers:

> We also conclude that the interexchange carriers have passed on the savings they have received from lower interstate exchange access charges to end-users. The AT&T price cap plan requires AT&T to treat changes in the access charge rates it pays to LECs as exogenous and pass through any savings from reductions in those charges to residential service basket customers. This may be accomplished through the use of optional calling plans, promotions and discounts from the basic rates. Our recent performance review of the AT&T price cap plan indicated that AT&T has passed on these cost reductions to its customers. Although basic rates have remained relatively high, AT&T has passed on its savings from lower access charges in the form of optional calling plans and other discounts and promotions. We also have no reason to believe that AT&T's long distance competitors have not been forced by competition to follow suit. Thus, although the data BellSouth offered to show that basic long distance rates have not decreased may be correct, that data fails to capture the effect of optional calling plans and other discounts.[202]

But optional calling plans did not offer the subscriber a lower price on the same service; rather, they reduced price on inferior off peak service. Prices on those plans did fit into the index, and they did offer lower charges for an inferior service. The Commission played with the index, and made changes in the index fit its explanation.

CONCLUSION

Long-distance telephone regulation since divestiture has kept the

202. 77 Rad. Reg. 2d (P&F) 783, 795 ¶ 61 (1995).

price structure in place, but has not made it competitive. The Commission has not expressly admitted that its actions, particularly its reluctance to abandon the equal-charge rule and to deregulate AT&T's residential services, have fostered market sharing. As Huber said, "[T]hat [other carriers] seem to thrive under Commission regulation probably proves much more about regulation than about competition."[203]

Of course, it is possible that the Commission is merely overcautious or reluctant to abandon its earlier commitments to foster the development of MCI and Sprint. It is possible that these carriers' insistence that deregulation would be a disaster for them is correct. But the long-distance companies have been pushed and pulled to employ the tariffing process to interact with one another in their markets in ways that foster the collective development of non-competitive price levels. As Sappington and Weisman have pointed out, the Commission's regulatory policies have practically required collusion. If AT&T competes too aggressively and thereby manages to gain a larger share of long-distance markets, it faces the prospect of asymmetric regulatory constraints."[204] And "competitors may refrain from aggressive battle in the marketplace if the reward for winning the battle is the privilege of facing AT&T on equal terms."[205] The system of Federal Communications Commission regulation in the first decade after divestiture was not designed to complete an evolution to competitive markets. It was, perhaps, under the circumstances the best possible system to preserve and develop entrant carriers after decades of AT&T dominance. But the question still to be raised at this point is the extent to which regulation and antitrust "worked" to make prices at least partially competitive.

203. GEODESIC NETWORK II, *supra* note 3, at 3.19.
204. DESIGNING INCENTIVE REGULATION, *supra* note 55, at manuscript 227.
205. *Id.*

4

Concentration Levels and Service Provider Conduct in Long-Distance Markets After 1984

THE RELATIVE SIZES OF THE THREE LARGEST service providers, based on their shares of long-distance revenues, changed substantially in the first five years after the divestiture decree. Initially, AT&T dominated provision of service, with almost all of those revenues. AT&T still had more than 90 percent of interLATA toll revenues, while MCI and Sprint had 5 and 3 percent, respectively. But from 1984 to 1989, while AT&T's ranking stayed the same its share decreased by 20 percent, and MCI and Sprint shares increased by 8 and 6 percentage points, respectively.

Subsequently, from 1990 to 1993, the shares of the three large providers stabilized. AT&T did lose three percentage points to MCI, but none to Sprint. Even so the share reallocation process that had substantially increased the relative size of the second and third firms in the 1980s ceased. By the end of 1993 AT&T had 65 percent while MCI and Sprint together had 29 percent of interLATA service revenues.[1] That pattern of concentration[2] did not

1. FCC, LONG-DISTANCE MARKET SHARES, FOURTH QUARTER (1993), tables 5 and 6.

2. The measure of "concentration" in this chapter is the Herfindahl-Hirschman Index (HHI), equal to the sum of the squared shares of firm sales, with shares in decimal terms. That index enables one to make comparisons of concentration between that for an "equivalent" number of equal-sized firms and that observed in a market when shares are not in fact equal. The HHI ranges from one to zero, with one indicating that a single firm makes all the sales and zero indicating that an infinite

vary across the four largest service markets; the initial loss of market share for AT&T in message toll services (MTS), outbound wide-area telecommunications services (WATS), inbound WATS (800 number services), and virtual network services (VNS) in the late 1980s was much the same and was followed by stability in share in the early 1990s.

Although the antitrust decree itself did not mandate reductions in AT&T's market shares, the application of the decree and the regulatory practices and procedures then in place provided exceptional opportunity for other carriers to take additional shares. AT&T's tariffs were subject to regulatory processes that did not apply to other carriers that made its prices relatively inflexible. - Access charges paid by all three toll service providers to local exchange carriers were set to favor the non-AT&T carriers. That AT&T was required to pay more for access than MCI and Sprint[3] was intended to compensate subscribers for MCI and Sprint's lower quality access. But AT&T ended up being charged enough more to induce customers to shift to MCI and Sprint's services.[4] Only when the FCC equalized access charges at the end of the 1980s was that incentive for customers to shift eliminated.

The stability in revenue shares after 1989 was consistent with an important change in the Federal Communications

number of firms is present. The reciprocal of HHI is the number of equivalent, equal-sized firms; if

$$HHI = \sum_{i=1}^{n} S_i^2$$

for share S_i of firm i and each of n firms is of equal size, so that $S_i = 1/n$, then $HHI = \Sigma\,(1/n)^2 = 1/n$.

3. For example, in 1983 specialized common carriers paid an access charge only 45 percent that of AT&T's charge. MacAvoy & Robinson, *Winning By Losing, supra* note 4, at 34. That same percentage discount held through 1987 for less-than-equal access connections.

4. *See* Paul W. MacAvoy & Kenneth Robinson, *Losing by Judicial Policymaking: The First Year of the AT&T Divestiture*, 2 YALE J. ON REG. 251 (1985).

Commission's regulatory procedures. The Commission at that point in time had put in place price-cap controls on AT&T tariffs.[5] Henceforth, AT&T could initiate price increases or decreases in reaction to changes in other suppliers' prices on short notice. The cap on the percent rate of change in the index price greatly enhanced the range of AT&T's price flexibility. AT&T could decrease rates in markets by up to 5 percent, not including the change in the price cap, which could add 5 percent of further reduction.[6] Those conditions changed the relationship among the three large carriers so as to allow an effective AT&T response to strategic discounting of rates that would prevent gains from shifting share. AT&T could respond to tariffs MCI or Sprint submitted to the Commission before the rates took effect, and thus preclude any increase in share from being realized from such an initiative. In effect, the new procedures for tariff regulation established the basis for realizing stability in shares. Price caps facilitated a new collective discipline among the three large carriers.[7]

CONCENTRATION IN KEY NATIONAL INTERLATA MARKETS

The services provided by the three major carriers in the four most important markets are described as follows:

- *Message Toll Service*: calls from local exchange networks by residential and small business consumers.
- *Outbound WATS*: voice or data business calls using either switched or dedicated access based on numerous rather than individual calls from that source.
- *Inbound WATS (800 Service)*: the receipt of long-distance voice or data business calls using either switched or

5. Policy and Rules Concerning Rates for Dominant Carriers, Report and Order and Second Further Notice of Proposed Rulemaking, FCC 89-91, 4 F.C.C. Rcd. 2873 (1989).

6. 4 F.C.C. Rcd. 3054 (1989).

7. This discipline was earlier anticipated theoretically. *Cf.* David S. Sibley and Simon J. Wilkie, *A Repeated Game of Price Cap Regulation*, UNIVERSITY OF TEXAS WORKING PAPER (Revised: January 1996)

dedicated access.

- *Virtual Network Services*: services provided in bulk to business customers using common carrier switching facilities as a user network indistinguishable from a facilities-based private network.

Revenue shares for the three largest carriers for those four classifications of service markets became more equal in the 1980s and either stabilized, or equalized at a much reduced rate, in the first half of the 1990s.[8] The Herfindahl Index, or HHI, for nationwide MTS service was 0.76 in 1985 (the equivalent of that for 1.3 equal-sized firms), declined to 0.54 in 1990 (the equivalent of 1.9 equal-sized firms), and then declined further but very gradually to 0.50 (two equal-sized firms) over the first four years of the 1990s.

Business services break down into three key sets of markets: inbound (800 number service) WATS, outbound WATS, and virtual network services. The HHI for inbound WATS was initially 1.0 in 1985, given that AT&T was the only carrier to offer interLATA 800 services, but fell rapidly on the entry of the other two carriers to 0.53 (1.9 equal-sized firms) by 1990 and stabilized at that level from 1990 to 1993. Concentration in outbound WATS services nationwide was below that in inbound WATS at the end of the nine year period. The index for outbound WATS equaled 0.75 (1.3 equal-sized firms) in 1986, declined until 1991, and then stabilized at the relatively low level of 0.30 (3.3 equal-sized firms).[9] Concentration in markets for virtual network services was similar to that in inbound WATS but not outbound WATS services; the HHI -

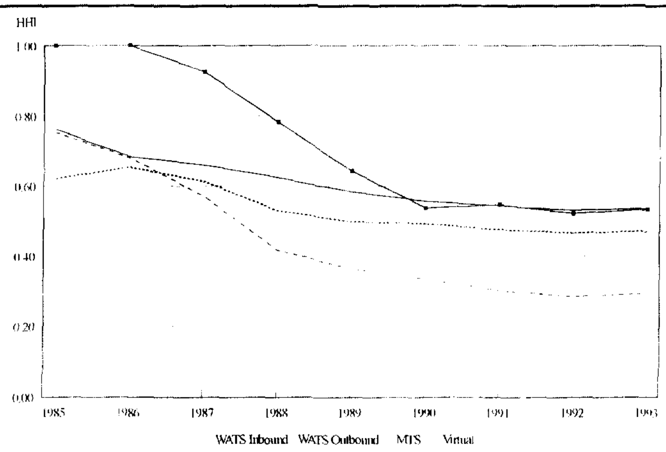
8. The data in this analysis were obtained from Multinational Business Services, Inc., based on historical series on revenues by company and class of service. Those were compiled from filings made with the FCC and state public utilities commissions, corporate reports, Wall Street analysts' reports, academic publications, interviews with corporate officials, and information obtained from federal and state regulatory agencies through Freedom of Information Act requests.

9. The HHI for each market from 1991 to 1993 has been estimated based on the assumption that the trend behavior for the total toll services applies on specific services. That is, a specific toll has been regressed on total toll shares and extrapolated for the later period from the regression coefficient for total toll and from later-period total toll assimilations. Such a procedure is used because data on specific service shares are not available after 1990.

declined from 0.65 in 1986 to 0.47 in 1989 (the equivalent of 2.1 equal-sized firms) where it remained throughout the early 1990s.

Figure 4–1 shows index levels in those four markets from 1985 to 1993. They reveal systematic reductions in concentration in all markets that converge to an HHI of 0.5 (except for outbound WATS, where the level was close to 0.3). For message toll service, the reduction in HHI was equivalent to the addition of one-half an identical-sized firm, so that by 1993 there were two equal-sized sources of supply. For virtual network services, the index change was equivalent to the addition of three-quarters of a firm, which left the market with slightly more than two equal-sized firms. For inbound WATS, the declines in the HHI characterize the market structure as that associated with a transition from one to two same-sized firms. But for outbound WATS, the changes took the HHI from one-and-one-third equal-sized firms to the equivalent of three equal-sized firms. Those changes in shares in each of the sets of markets mostly took place before 1990. Henceforth, these markets operated as if there were a static structure in service supply, or as if there were two equal-sized firms in message toll and in inbound and network WATS business services, but three equal-sized firms in outbound WATS business services.

FIGURE 4-1
HERFINDAHL INDICES IN FOUR SETS
OF LONG-DISTANCE MARKETS



Source: The HHIs for the 1985-90 period are based on company by company revenues from Multinational *Business* Services, Inc.; c.f. Multinational Business Services, Inc., Interexchange Competition in the Price Cap Era: A Quantitative Analysis by Major Carrier, Service and Market Basket (Washington, DC 1990) at B-1 to B-8. The HHIs for the 1991-93 period are estimated from a regression model in which HHI values in specific classes of service have been regressed for long distance market shares. This is necessary because company-specific data by class of service is available only for 1985-1990.

CONCENTRATION IN INTERLATA MARKETS IN CALIFORNIA

Since 1984, InterLATA market shares in California have been determined by the same market and regulatory conditions as in the rest of the country. The shares of the major facilities-based carriers of interLATA toll service revenues in California from 1984 to 1991 (in table 4–1) indicate a six percentage point annual decline for AT&T from 1984 to 1989 and a two-and-one-half percentage point annual decline from 1990 to 1991. MCI's share increased rapidly from 1984 to 1990, while Sprint's share increased from 1984 to 1986 and then stabilized. The HHI shows a similar pattern, that is, a rapid decline from 1984 to 1989, followed by a leveling off in 1990 and 1991, at least in relative terms.

TABLE 4–1
SHARES (%) OF TOTAL MINUTES-OF-USE
OF INTERLATA SERVICE IN CALIFORNIA

Year	AT&T	MCI	Sprint	HHI
1984	100	0	0	1.00
1985	88	5	6	0.78
1986	80	8	10	0.66
1987	77	9	11	0.61
1988	75	11	11	0.59
1989	70	14	12	0.52
1990	67	17	12	0.49
1991	65	18	13	0.47

Source: California Public Utilities Commission, Commission Advisory and Compliance Division, REPORT ON 1991 CALIFORNIA INTEREXCHANGE MARKET MONITORING PLAN (December 1993) exhibit 5.

Even so, shares of revenues in specific markets were not the same in California as across the country. The HHI for interstate outbound WATS in 1985 was at the level of .75 (1.3 equal-sized firms), fell relatively rapidly to 1988, and then stabilized at .30 (3.3 equal-sized firms) by 1993.[10] The HHI for intrastate outbound WATS shows a different pattern: it fell from 0.98 in 1986 to 0.19 in 1989 and then rose to 0.33 by 1992.[11] The HHI for intrastate

10. The HHI for outbound WATS from 1991 to 1994 is calculated by assuming the same trend behavior as for total toll services. That assumption causes the HHI for outbound WATS to decline from 0.33 in 1990 to 0.27 in 1994. That would imply that AT&T's market share declined by as much as one-fourth in that period. Such a decline, in my view, is extremely unlikely. It is more likely that the HHI for outbound WATS is currently in the range of 0.3 to 0.4, given the known value of 0.37 for intrastate outbound WATS in 1992, but specific data to indicate that are not available for the interstate market after 1990.

11. One reason for the different pattern is that the interstate HHI series does not account for shares of resellers, while the intrastate HHI series compiled by the California PUC does include resellers. The California PUC was able to remove resellers for one year, 1992, and the facilities-based intrastate HHI for that year

inbound WATS, initially at 0.99 in 1986, fell to 0.36 by 1992 and then reached the low value of 0.34 by 1993. Comparison of that with interstate inbound WATS shows that share concentration interstate exceeded that of intrastate in most years, but the differences were not large or as consistent as those for MTS and outbound WATS.

CONCENTRATION IN INTERNATIONAL LONG-DISTANCE MARKETS

A description of the structure of international markets has to begin with defining the product and geographic dimensions of those markets. The two primary products considered here are international message toll services (IMTS) and international wide-area toll services (IWATS). The first are for residential and small business customers; the second are services for high-volume business customers. International message toll is not a good substitute for IWATS for high-volume business customers, nor is IWATS a substitute for IMTS for residential customers given that each require inconvenient usage levels to achieve price parity. An additional important international service is discount IMTS service, for which carriers charge a fixed monthly fee and then offer lower rates per minute for use in off-peak periods. Discount IMTS plans offer lower rates than standard IMTS to customers making a sufficiently large number of calls to the extent that the larger call volume spreads the customer's cost of the monthly charge, and to the extent those calls originate in off-peak periods.

The geographic dimensions of those markets can be specified by example. Consider a customer desiring to place a call from the United States to Canada. For that customer, the option to call a number in Germany is not a substitute, nor would a triangular call from the United States to Germany to Canada be a cost-effective alternative. Therefore, specific country pairs form relevant markets for international outbound calls from the United States. Given such a condition, the important markets are focused on

equaled 0.37, approximately the same as the interstate HHI. The decline in the HHI to 0.19 in 1989 may be due to the presence of resellers whose relative importance in the market diminished after 1990.

national capitals or population centers of foreign destination countries to which U.S. customers place large volumes of calls. The pairs of the United States with eight foreign countries account for approximately 55 percent of the total outbound U.S. international calls.[12] Table 4-2 shows those country pairs and the 1993 volume of minutes billed in the United States in order from largest to smallest.

TABLE 4-2
SELECTED COUNTRY PAIRS AND VOLUME OF MINUTES BILLED IN THE UNITED STATES

U.S. to:	Millions of Minutes Billed
Canada	2,493
Mexico	1,398
United Kingdom	799
Germany	572
Japan	397
France	263
Dominican Republic	253
Italy	229

Source: *See* STATISTICS OF COMMUNICATIONS COMMON CARRIERS, 1993/1994 edition.

12. The only country of the top ten in revenue with the United States that was excluded was South Korea, which ranked eighth in 1993. *See* STATISTICS OF COMMUNICATIONS COMMON CARRIERS, 1993/1994 edition.

The toll volume shares in the mid-1980s for AT&T, MCI, and Sprint together mostly exceeded 90 percent.[13] Table 4-3 shows that concentration in supply as measured by HHI was higher than in domestic service markets. HHI levels were at or near one in 1985, given AT&T's monopoly position,[14] but then fell rapidly in those eight country pairs from 1988 to 1993. In fact, the HHI series in the six country pairs for which complete data are available indicate three quite different patterns of decline. In services to the United Kingdom, Italy, and Japan, HHI declined at a steady rate over the period, while in Germany and the Dominican Republic it remained at or near one for several years before then declining sharply. Finally, HHI for France fell rapidly from 1985 to 1987 and then declined at a more gradual rate. The resulting levels of HHI differed across countries within a fairly narrow range. By 1993, HHIs were as low as 0.42 for Canada (the equivalent of 2.4 equal-sized firms) to as high as 0.56 for Germany and Italy (the equivalent of 1.8 equal-sized firms). But in each country pair market, MCI and Sprint shares increased during the 1990s at the expense of AT&T, so that shares of the three firms became more equal.[15]

13. The Commission does not publish data on carriers' revenues by type of service, for example, IMTS or IWATS. The shares estimated here are carriers' percentages of total international toll service revenues for outbound calls from the United Sates to a specific foreign country.

14. Market share data were obtained from the FCC's INTERNATIONAL TELECOMMUNICATIONS DATA REPORT § 43.61 (various years). The Commission did not collect data for Canada and Mexico before 1991.

15. Canada, Japan, and Italy are the only countries where facilities-based carriers other than MCI and Sprint gained market share from AT&T. In those countries, facilities-based carriers other than AT&T, MCI, and Sprint accounted for 3.1 to 5.6 percent of the market by 1993.

TABLE 4-3
THE HERFINDAHL-HIRSCHMAN INDEX FOR OUTBOUND
U.S. SERVICE TO SELECTED COUNTRIES

U.S. to:	1985	1986	1987	1988	1989	1990	1991	1992	1993
Canada	n/a	n/a	n/a	n/a	n/a	n/a	0.51	0.44	0.42
Mexico	n/a	n/a	n/a	n/a	n/a	n/a	0.64	0.59	0.55
UK	0.91	0.78	0.73	0.68	0.61	0.57	0.54	0.52	0.50
Germany	1.00	1.00	1.00	0.86	0.73	0.68	0.67	0.62	0.56
Japan	1.00	0.96	0.80	0.71	0.64	0.57	0.56	0.52	0.43
France	1.00	0.89	0.69	0.66	0.61	0.56	0.54	0.52	0.49
Dominican Republic	1.00	0.95	0.93	0.97	0.82	0.73	0.70	0.67	0.52
Italy	1.00	0.97	0.83	0.76	0.71	0.65	0.64	0.60	0.56

Source: Market share data were obtained from the FCC'S INTERNATIONAL TELECOMMUNICATIONS DATA REPORT, § 43.61 (various years).

EXPLANATIONS FOR CHANGES IN CONCENTRATION

At the time the consent decree was drafted, there was controversy as to how long it would take for long-distance markets to experience significant declines in carrier concentration. But in 1983 MacAvoy and Robinson predicted that the consent decree would confer share gain advantages on AT&T.[16] While it has turned out that long-distance markets remained highly concentrated, in the late 1980s, from all appearances they were in the process of becoming less concentrated. MCI and, perhaps, Sprint, were trying then to take market share from AT&T. That ceased to be the case in the 1990s as shares became much more stable.

There were good market based reasons for this pattern of share behavior. Technology of telecommunications switching and transmission was advancing at a rapid and unpredictable pace. Microwave supplanted much of coaxial cable transport; its cost characteristics differed from those of the wireline technology that preceded it. Microwave was less-capital-intensive and made entry of smaller carriers in long-distance transport economically feasible. "The basic building block in microwave transmission is a radio capable of handling 12 voice calls; [since] long-distance networks typically carry a lot more traffic than that, ... transmission costs rise as traffic volumes increase--which in economic terms means that radio-based services are not 'natural monopolies'."[17] These new systems should have led to relative growth of smaller carriers.

But even in these early years after divestiture, carriers were replacing microwave transmission with fiber optic networks. Fiber-optic technology lowered the cost per message minute mile, but such savings were derived from expansion of throughput per unit of capital. Thus, Huber argued, long-distance transmission by fiber optic cable developed significant new natural monopoly characteristics to provision of service:

16. MacAvoy & Robinson, *Winning by Losing*, *supra* note 1, at 31.

17. PETER W. HUBER, MICHAEL K. KELLOGG & JOHN THORNE, THE GEODESIC NETWORK II: 1993 REPORT ON COMPETITION IN THE TELEPHONE INDUSTRY 3.3 (The Geodesic Co., 1992) [hereinafter GEODESIC NETWORK II].

> "Lightwave transmission . . . requires . . . investment up front, with tiny marginal costs thereafter. The carrier spends billions before the network generates a penny of revenue; but once in operation, the network can carry billions of minutes of traffic at pennies or less per minute. The marginal cost of carrying an extra minute of traffic is very close to zero."[18] Each of the nationwide facilities-based carriers—AT&T, MCI, and Sprint—currently has enough fiber capacity to carry all of the nation's long-distance traffic. By the late 1980s, Sprint alone had "far more capacity than it could possibly hope to utilize in the near-term" and "full provisioning of Sprint's fiber network would equip Sprint to handle . . . traffic . . . well in excess of AT&T's total switched traffic volume for the year."[19] In 1995 the FCC found "much of the network capacity owned by the long-distance carriers is fiber optic technology, which is capable of expansion to serve increasingly larger amounts of traffic at relatively low cost. In 1993, AT&T owned 47 percent of the total fiber miles while serving 60 percent of the minutes of use of the interexchange market. In contrast, all other interexchange carriers owned 53 percent of the total-fiber miles while serving 40 percent of the interexchange market. It therefore appears that AT&T's competitors have a greater supply of unused fiber capacity than AT&T."[20]

New generations of fiber optic technology increased the existing network's capacity further.[21] Since the introduction of fiber,

18. *Id.* at 3.4.

19. Competition in the Interstate Interexchange Marketplace, Report and Order, CC Dkt. No. 90-132, 6 F.C.C. Rcd. 5880, 5888 ¶ 44 (1991).

20. *Price Cap Revisions*, 10 F.C.C. Rcd. at 3009, 3017 ¶ 23.

21. Emmanuel DeSurvire, *Lightwave Communications: The Fifth Generation*, SCI. AM., Jan. 1992, at 114.

technological advances have increased installed capacity from 45 megabits per second to 90 megabits per second, to 540 megabits per second, then to 1.2 gigabits per second and now to 2.4 gigabits per second.[22] In 1994 Sprint announced deployment of synchronous optical network (SONET) rings, which would carry information at 2.4 gigabits per second, and expects to complete deployment of rings throughout its national network by the end of 1996.[23] Sprint has since deployed about 23,000 miles of SONET fiber.[24] MCI announced deployment of SONET the same year,[25] and now has also deployed 23,000 miles of SONET fiber.[26] AT&T's announcement followed in 1995.[27] Along with its use of SONET, AT&T will employ wave division multiplexing—a means of assigning multiple signals on the same fiber path to different wavelengths—that will increase the capacity in parts of its network to about 20 gigabits per second.[28] MCI has already begun to deploy wave division multiplexing and expects to increase network capacity to 7.5 gigabits per second.[29] Each gigabits per second increase in capacity lowers the costs of carrying additional bits on established networks by an order of magnitude.

The technological conditions for long-distance services are now such that the three large carriers have significant cost advantages over any entirely new entrants and also over current small carriers. The fixed costs of rights of way and installation of fiber optic cable stand as a barrier to other potential carriers. Any

22. John T. Mulqueen, *Ten Years of Change*, COMM. WK., Jan. 3, 1994, at 8.

23. Christine Heckart, *SONET Strategies: Sprint Has Ring Fling*, NETWORK WORLD, May 16, 1994, at 45.

24. Tom Williams, *Carriers Pick Up Speed on SONET Deployment; Synchronous Optical Network Transport Architecture*, TELEPHONY, May 15, 1995, at 32.

25. Paul Weichselbaum, *MCI's Broadband Telecommunications Solutions for Demanding Imaging Apps; MCI Communications Corp.*, ADVANCED IMAGING, June 1994, at 42.

26. Williams, *supra* note 124, at 32.

27. Dan O'Shea, *AT&T Forges Ahead with Network Upgrades*, TELEPHONY, June 12, 1995, at 12.

28. *Id.*

29. MCI COMMUNICATIONS CORP., MCI PRESS RELEASE: "MCI DEPLOYS TECHNOLOGY CAPABLE OF INCREASING CAPACITY BY FIFTY PERCENT WITHOUT NEW FIBER," Aug. 30, 1995; *MCI Hopes to Boost Network Capacity 50% Through New Method*, WALL ST. J., Aug. 31, 1995, at B5.